CANADIANS DISPOSE OF ABOUT 22 MILLION TONNES OF WASTE EACH YEAR. IMAGINE SIX FOOTBALL FIELDS PILED ONE KILOMETRE HIGH WITH GARBAGE! COMPOSTING CAN BE PART OF THE SOLUTION.

Composting has two benefits: it helps to reduce the amount of waste going to landfills and to recover a valuable resource. It is estimated that approximately 40% to 60% of the total waste stream could be composted!

IN ADDITION TO REDUCING THE AMOUNT OF WASTE GOING TO LANDFILLS, COMPOSTING IS ONE WAY TO RETURN NUTRIENTS TO THE SOIL. IT HELPS TO COMPLETE THE CARBON CYCLE. COMPOST IS A VALUABLE RESOURCE IN ITSELF FOR LANDSCAPING, IN POTTING SOIL FOR THE HORTICULTURAL INDUSTRY AND IN AGRICULTURE. BACKYARD COMPOSTING IS NOT ALWAYS APPROPRIATE. INDUSTRY HAS UNDERTAKEN LARGE-SCALE CENTRALIZED COMPOSTING PROJECTS AND SOME MUNICIPALITIES HAVE ALSO DEVELOPED CENTRALIZED COMPOSTING FACILITIES AND PROGRAMS FOR ORGANIC WASTES.

THE

finished product

When the composting process has been completed, the material is screened to remove any uncomposted materials. Good-quality compost is valuable for use in landscaping, in potting soil for the horticultural industry and in agriculture. Compost can replace the valuable organic material lost from agricultural land, and it helps complete the carbon cycle by returning the carbon to the non-living environment.

Your garden will benefit from the humus produced by composting. Adding compost will improve the texture of clayey and sandy soils and restore essential nutrients. Your flowers, plants and vegetables will thrive!

Environmental Citizenship

As Canadians, it is our responsibility to care for the environment. It is also in our best interests. Many Canadians have already put their concern about the environment into action – recycling is a good example. But we need to do much more, and get everyone involved. Let's work together and become good

Environmental Citizens!

WORD MATCH

Find the right combination.
Match a letter with a definition.

1. Composting helps complete the ___.
2. A good reason to compost. ___
3. Materials that will break down in nature. ___
4. Centralized composting involves the ___ of organic material to a facility where it will be composted.
5. Compost can replace the valuable ___ lost from agricultural land.
6. Two types of centralized composting. ___ .
7. Two things that can be added to a centralized composting facility to maintain ideal conditions. ___

A. organic matter
B. carbon cycle
C. water, oxygen
D. collection and transportation
E. organic waste
F. windrow, channels
G. full landfills

For more information about composting, please contact:
The Composting Council of Canada
200 MacLaren Street, Suite 300
Ottawa, Ontario K2P 0L6

To find out more about the Environmental Citizenship Program, please contact:
Environment Canada
Enquiry Centre
Ottawa, Ontario K1A 0H3
Toll free: 1-800-668-6767 or
(819) 997-2800

Canada

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WASTE MANAGEMENT INFORMATION SERIES

CENTRALIZED COMPOSTING

HELPING TO COMPLETE

the carbon cycle

Environment Canada Environnement Canada

Environmental Citizenship

WHAT IS

composting?

Composting is a natural process whereby micro-organisms transform organic waste materials into a soil-like product called humus (pronounced "hue-mous"). Kitchen scraps, leaves and yard waste, paper, wood, food-processing wastes, as well as agricultural crop wastes and animal manures, are excellent organic waste materials that can be composted.

Composting has two benefits: it helps to reduce the amount of waste going to landfills and to recover a valuable resource. It is estimated that about 40 to 60 percent of the total waste stream could be composted!

For the composting process to work best, it is important that the micro-organisms have a continuous supply of food (i.e., organic wastes), water and oxygen. As well, managing the temperature of the composting material is important to make the process work.

Although most organic wastes supply all of the nutrients necessary for the micro-organisms to grow, they grow best with certain levels of carbon (C) and nitrogen (N). Paper, leaves and wood are high in carbon, while grass clippings and vegetable trimmings are high in nitrogen. The materials in the composting "recipe" need to be mixed in the correct combination to create the right C:N ratio.

DID YOU KNOW?
The number of centralized composting facilities throughout Canada has more than tripled - from 30 to over 120 - since 1989.

THE

carbon cycle

Carbon is an essential component of all living things. It exists mostly as carbon dioxide in the atmosphere and oceans, and in fossil fuels stored beneath the Earth's surface. The major steps of the carbon cycle are these:

- Carbon dioxide in the atmosphere is absorbed by plants and converted into sugar by the process of photosynthesis.
- Animals eat plants, breaking down the sugars and releasing carbon into the atmosphere, oceans and soil.
- Other organisms break down dead plant and animal matter, returning carbon to the non-living environment.
- Carbon is also exchanged between the oceans and the atmosphere.

Composting helps complete the carbon cycle by returning the carbon to the non-living environment by decomposing plant and animal matter.

photosynthesis

respiration

Types of Composting

Composting can be done in many different ways. Types of composting range from residential or backyard composting to mid-scale and central municipal or industrial composting systems. Selecting the most suitable method depends on the amount and type of organic materials to be composted.

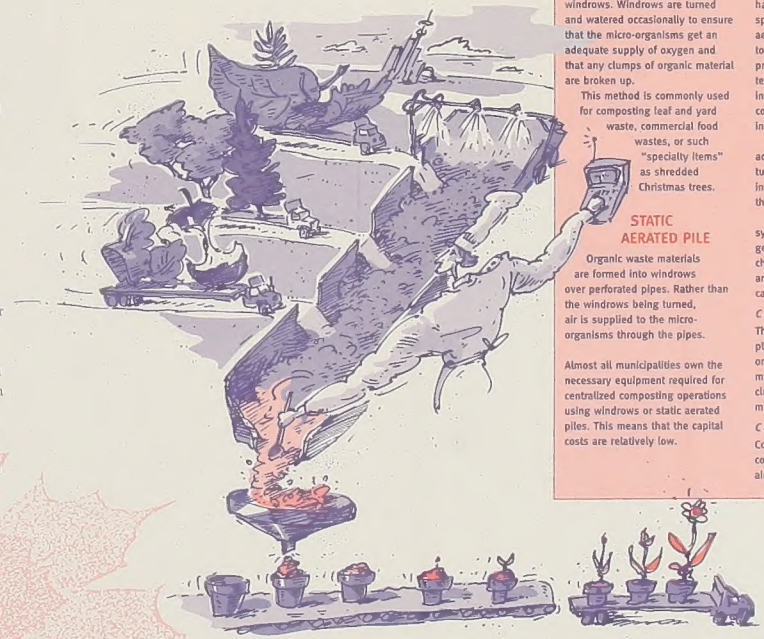
DID YOU KNOW?
Approximately half of Canada's population lives in areas which have access to some type of centralized composting.

Residential or backyard composting means that an individual household composts most of its food and yard waste in a container located outside the home. Worm composting is a viable option to compost kitchen waste indoors. This is the simplest and most cost-effective method because collection, transportation and costs are avoided. People benefit directly from their own efforts by producing a valuable additive for their own garden soil.

However, not all food and yard waste can be managed so simply. Organic material from commercial sources, such as restaurants, supermarkets, apartment buildings and food manufacturers, needs to be managed differently. This is where mid-scale and centralized composting fits in.

Both mid-scale and centralized composting involves significantly larger quantities and a larger variety of organic wastes.

Mid-scale composting is the on-site management of organic waste generated by a group of people, such as in an apartment complex, office building or hospital. This avoids the transportation of organic waste. Centralized composting involves the collection and transportation of organic material to a special facility where it will be prepared and processed into compost.



CENTRALIZED COMPOSTING

facilities

The design and set-up of a centralized composting site must take into account such factors as the type and volume of organic waste, waste collection methods, sorting, storage factors and the end use for the finished compost. Quality organic wastes and good operating procedures ensure the production of high-quality compost.

Among the most common centralized composting process technologies, in order of increased technology, are:

WINDROWS

Organic materials are placed in long triangular rows called windrows. Windrows are turned and watered occasionally to ensure that the micro-organisms get an adequate supply of oxygen and that any clumps of organic material are broken up.

This method is commonly used for composting leaf and yard waste, commercial food wastes, or such "specialty items" as shredded Christmas trees.

STATIC AERATED PILE

Organic waste materials are formed into windrows over perforated pipes. Rather than the windrows being turned, air is supplied to the micro-organisms through the pipes.

Almost all municipalities own the necessary equipment required for centralized composting operations using windrows or static aerated piles. This means that the capital costs are relatively low.

IN-VESSEL

In-vessel systems are either fully or partially enclosed, and can handle more material in a smaller space than windrows or static aerated piles. However, they tend to be more costly. These systems provide better control of aeration, temperature and the moisture in the organic materials being composted, all of which result in faster decomposition.

If necessary, water can be added to maintain the correct moisture level, and air can be pumped in to provide oxygen and to control the temperature.

Although different in-vessel systems are available, they are generally of three basic types: channels or troughs, containers and rotating drums (sometimes called tube digesters).

Channels (or Troughs)

The composting process takes place in long rectangular troughs or channels. The organic waste materials are mixed so that the clumps are broken up and the material is aerated.

Containers

Composting takes place in closed containers that are supplied with air. Excess moisture and exhaust air are removed from the containers to maintain ideal conditions for the micro-organisms throughout the process.

Rotating Drums (Tube Digesters)

Organic waste materials are added to a drum which is continuously rotating. The rotation ensures that the micro-organisms are constantly supplied with the oxygen they need and that all of the organic waste materials are exposed to them. The material remains in the drum for three to five days and is then transferred to windrows for final curing.

ANAEROBIC DIGESTERS

Organic waste materials can also be digested in an oxygen-free, or anaerobic, environment by micro-organisms that do not need oxygen. The length of time required to digest the organic waste material varies according to the individual technology – usually between two and twenty days. The process produces humus, methane and carbon dioxide. The methane is captured and converted into energy. Following digestion, the humus is transferred to windrows for final composting.